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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,901	03/22/2001	David Palagashvili	AM 3137	9710

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APPLIED MATERIALS, INC.
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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 03/12/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/815,901

Applicant(s)

PALAGASHVILI ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 and 11 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "the surface" in line 2. There is insufficient antecedent basis for this limitation in the claim. Furthermore, note that claim 9 is indefinite because it depends on itself.

Claim 11 recites the limitation "the space" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2 and 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hao et al., U.S. Patent 6,123,775 in view of Degner et al., U.S. Patent 5,074,456.

Hao et al. shows the invention substantially as claimed including a thermal transfer device comprising a thermal source 20 maintained in parallel to a thermal sink 22 and having thermally conductive coils 36 between them (see col. 5, lines 8-52 and figs. 4 and 4a).

Hao et al. does not expressly disclose a material that is compressible and in the form of a single multiple turn coil. Degner et al. discloses the use of a material between the heat sink and the heat source that is compressible in order to prevent breaking or fracture due to thermal expansion (see, for example, col. 5-line 64 to col.7-line 12). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Hao et al. so as to make the coil of a compressible material because in such a way breaking or fracture will be prevented during thermal expansion at the same time that excellent thermal and electrical conductivity to the heat sink will be provided.

With respect to the single multiple turn coil, in col. 5, lines 45-48, the reference clearly discloses that heat transfer members 36 can be in other suitable shapes. Furthermore, the claimed coil configuration would have been a matter of choice which a

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person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed coil is significant, see *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

With respect to claims 2, 6, and 8-11, note that the thermal sink surrounds the thermal source and that both are concentric (see fig. 4); the thermally conductive coil can be made of Cu (see col. 4-line 42); the outer wall of the thermal sink is grooved to accommodate the compressive coil, and the coil fills a gap between the thermal source and the thermal sink (see fig. 4); the thermal sink includes means for cooling (see col. 3, lines 48-50).

Regarding claim 7, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, see *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herchen, U.S. Patent 5,747,917 in view of Hao et al., U.S. Patent 6,123,775 and further in view of Degner et al., U.S. Patent 5,074,456.

Herchen shows the invention substantially as claimed including a vacuum chamber comprising: a processing chamber 62 including a substrate to be processed; a processing gas inlet source 82 that traverses a microwave energy source 63 for

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forming plasma from the processing gas; a microwave impervious gas inlet 42 made of a dielectric material in the form of a tube that provides a thermal source, the dielectric tube surrounded by a concentric dielectric tube 44 that provides a thermal sink (see col. 4-line 53 to col. 47 and figs. 3 and 4).

Herchen does not expressly disclose a compressible, conductive multiple turn coil between the thermal sink and the thermal source. Hao et al. discloses an apparatus comprising a thermal transfer device comprising a thermal source 20 maintained in parallel to a thermal sink 22 and having thermally conductive and compressible coils 36 between them and wherein the coils can be made of Cu (see col. 4-line 42, col. 5, lines 8-52, and figs. 4 and 4a). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Herchen as to further comprise a coil between the heat source and the heat sink in order to improve temperature control of components of a reaction chamber by providing a heat flow path from an elevated temperature region of the heated member to the heat sink; improve temperature uniformity of the surfaces; and improve uniformity of the distribution of power to the plasma. Hao et al. do not expressly disclose the use of a compressible coil or the use of a single multiple turn coil. Degner et al. discloses the use of a material between the heat sink and the heat source that is compressible in order to prevent breaking or fracture due to thermal expansion (see, for example, col. 5-line 64 to col.7-line 12). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Herchen modified by Hao et al. so as to make the coil of a

compressible material because in such a way breaking or fracture will be prevented during thermal expansion at the same time that excellent thermal and electrical conductivity to the heat sink will be provided. With respect to the single multiple turn coil, in col. 5, lines 45-48, Hao et al. clearly disclose that heat transfer members 36 can be in other suitable shapes. Furthermore, the claimed coil configuration would have been a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed coil is significant, see *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Regarding claim 7, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, see *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

With respect to claims 2-5, 8, and 10, note that the thermal sink 44 surrounds the thermal source 42 and that both are concentric (see figs. 3 and 4); the thermal source and the thermal sink are made of sapphire (see col. 5, lines 34-42); and the thermal sink includes means for cooling (see col. 5, lines 14-17).

Regarding claim 9, note that Hao et al. discloses that the outer wall of the thermal sink is grooved to accommodate the compressive coil. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Herchen by accommodating the

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coil in a groove in the thermal sink because such configuration is suitable for a good thermal contact and heat transfer. Furthermore, Hao et al. clearly discloses that the heat transfer members 36 can be integral pieces with the heat sink (see col. 6, lines 5-8 and fig. 6).

With respect to claim 11, note that Hao et al. discloses that the coil fills a gap between the thermal source and the thermal sink (see fig. 4). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Herchen as to locate the coil in the gap between the thermal source 42 and the thermal sink 44 in order to improve the thermal contact and heat transfer between the thermal source and the thermal sink.

Response to Arguments

Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Luz L. Alejandro
Patent Examiner
Art Unit 1763

March 10, 2003